Space Weather Forecast

Issued on Saturday, 08 January 2022 at 00:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of G1/Minor Storm Days 1 and 2 (08 and 09 Jan), and M-class flares (R1-R2 radio blackout) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low over the past 24 hours, with two Common class flares observed. There are currently two sunspot groups on the visible disc, and are both located in the southeast quarter. One is a small and relatively simple region, the other more western group is larger and more magnetically complex. No Earth-directed Coronal Mass Ejections (CMEs) have been observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds were largely stable at ambient levels through this period. Wind speeds showed a slight decrease, and are now near or just above 300 km/s. The interplanetary magnetic field strength was weak at 4 nT or below. The north-south component varied weakly, but was largely positive. Geomagnetic activity has been Quiet (Kp 0).

Energetic Particles / Solar Radiation: The count of energetic particles (high energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain low or very low with further Common-class flares possible and a slight chance of Moderate-class flares, most likely from the larger region on the disc. Returning previous regions are expected to rotate onto the visible disc during Day 1 (08 Jan). Solar activity is likely to increase as these regions rotate on, giving a gradual slight upward trend in flare risk.

Solar Wind / Geomagnetic Activity: There are currently no Earth-directed CMEs. Solar wind speeds are starting at slow levels, before a fast wind from a coronal hole is expected to arrive later on Day 1 (08 Jan). Wind speeds may reach elevated levels, before slowly declining later in the period. Quiet geomagnetic activity is expected at first, increasing to Unsettled to Active with a slight chance of G1/Minor Storms later on Day 1 into Day 2 (09 Jan). Activity is currently expected to return back to Quiet again during Day 3 (10 Jan).

Energetic Particles / Solar Radiation: The count of energetic particles (high energy protons) is most likely to persist at background levels. However, there is a very slightly increasing risk of a solar radiation event as the larger sunspot moves towards the western side of the Sun.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	20	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	15	20	20
Very Active	R3 to R5 X	No	1	1	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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